MIR146A gene

microRNA 146a

Normal Function

The *MIR146A* gene provides instructions for making microRNA-146a (miR-146a). MicroRNAs (miRNAs) are short lengths of RNA, a chemical cousin of DNA. These molecules control gene expression by blocking the process of protein production. MiR-146a is abundant in immature blood cells and controls the expression of hundreds of genes. This microRNA is thought to be involved in normal blood cell development. In particular, miR-146a appears to play a role in the growth and division of blood cells called megakaryocytes, which produce platelets, the cell fragments involved in blood clotting.

Health Conditions Related to Genetic Changes

5q minus syndrome

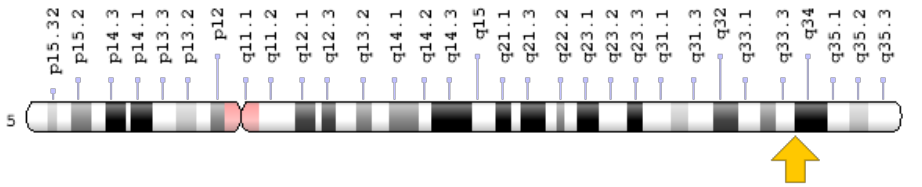
The *MIR146A* gene is involved in a condition called 5q minus (5q-) syndrome. This condition is a type of bone marrow disorder called myelodysplastic syndrome (MDS), in which immature blood cells fail to develop normally. Individuals with 5q- syndrome often have a shortage of red blood cells (anemia) and abnormalities in megakaryocytes. Affected individuals also have an increased risk of developing a fast-growing blood cancer known as acute myeloid leukemia (AML).

5q- syndrome is caused by deletion of a region of DNA from the long (q) arm of chromosome 5. This deletion occurs in immature blood cells during a person's lifetime and affects one copy of chromosome 5 in each cell. Most people with 5q- syndrome are missing a sequence of about 1.5 million DNA building blocks (base pairs), also written as 1.5 megabases (Mb). This deleted region contains 40 genes, often including *MIR146A*. Loss of one copy of the *MIR146A* gene reduces the amount of the microRNA miR-146a in cells. As a result, levels of proteins whose production is normally blocked by miR-146a are elevated, which leads to the abnormal development of megakaryocytes that occurs in 5q- syndrome. Research suggests that the other features of the condition are associated with other genes in the deleted segment of DNA.

Chromosomal Location

Cytogenetic Location: 5q33.3, which is the long (q) arm of chromosome 5 at position 33.3

Molecular Location: base pairs 160,485,352 to 160,485,450 on chromosome 5 (Homo sapiens Annotation Release 108, GRCh38.p7) (NCBI)



Credit: Genome Decoration Page/NCBI

Other Names for This Gene

- hsa-mir-146
- hsa-mir-146a
- miR-146a
- MIRN146
- MIRN146A
- miRNA146A

Additional Information & Resources

Educational Resources

- Stembook (2008): MicroRNA Biogenesis and Function https://www.ncbi.nlm.nih.gov/books/NBK27061/#theroleofmicrornasingermline.sec1-3

Scientific Articles on PubMed

- PubMed https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28MIR146A%5BTIAB%5D%29+OR+%28microRNA+146a%5BTIAB%5D%29%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+720+days%22%5Bdp%5D

OMIM

- MICRO RNA 146A
  http://omim.org/entry/610566

Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology
  http://atlasgeneticsoncology.org/Genes/GC_MIR146A.html
- HGNC Gene Family: MicroRNAs
  http://www.genenames.org/cgi-bin/genefamilies/set/476
- HGNC Gene Symbol Report
  http://www.genenames.org/cgi-bin/gene_symbol_report?q=data/hgnc_data.php&hgnc_id=31533
- NCBI Gene
  https://www.ncbi.nlm.nih.gov/gene/406938

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